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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,029	04/09/2001	Ardavan Maleki Tehrani	0269534 ATH-053	9008

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**PILLSBURY MADISON & SUTRO LLP**  
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EXAMINER

CRAVER, CHARLES R

ART UNIT	PAPER NUMBER
2682	5

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/832,029

Applicant(s)

TEHRANI ET AL.

Examiner

Charles R Craver

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1)  Responsive to communication(s) filed on \_\_\_\_\_.
- 2a)  This action is **FINAL**.                      2b)  This action is non-final.
- 3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4)  Claim(s) 1-149 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5)  Claim(s) \_\_\_\_\_ is/are allowed.
- 6)  Claim(s) See Continuation Sheet is/are rejected.
- 7)  Claim(s) 40,43,44,50-55,69,72-76,85,91,97-101,120,127,132,136-139 and 144-147 is/are objected to.
- 8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9)  The specification is objected to by the Examiner.
- 10)  The drawing(s) filed on 09 April 2001 is/are: a)  accepted or b)  objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \*    c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1)  Notice of References Cited (PTO-892)
- 2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2, 3.
- 4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5)  Notice of Informal Patent Application (PTO-152)
- 6)  Other: \_\_\_\_\_.

Continuation of Disposition of Claims: Claims rejected are 1-39,41,42,45-49,56-68,70,71,77-84,86-90,92-96,102-119, 121-126,128,129-131,133-135,140-143,148 and 149.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-10, 13, 14, 17, 20, 22-29, 32-39, 41, 42, 45, 48, 56-68, 70, 77-84, 86-89, 92, 93, 95, 102-114, 117-119, 121-125, 127-131, 134, 140-143, 148 and 149 are rejected under 35 U.S.C. 102(b) as being anticipated by Bantz, EPO 0 622 911 A2.

**Claim 1:** Bantz discloses a method of providing antenna diversity in a communications system that contains a transmission device (FIG 1) that sends and receives a plurality of transmit and receive packets (reads unicast) at a single location, the transmission device including two antennas 1 and 2, the method comprising

designating one antenna of the two antennas as a default antenna, wherein an antenna of the two antennas other than the antenna that is designated as the default antenna is an alternate antenna (col 2 lines 26-58),

sending each transmit packet a first time using the default antenna as a transmit antenna, wherein for any transmit packet, the transmit antenna is whichever antenna of the at least two antennas is used to send the transmit packet,

listening for each receive packet that acknowledges a previously sent transmit

packet using as a receive antenna the transmit antenna that was used to send the previously sent transmit packet, wherein for any receive packet, the receive antenna is whichever antenna of the at least two antennas is used to listen for the receive packet, listening for all other receive packets using the default antenna as the receive antenna,

reversing which antenna of the two antennas is the default antenna and which antenna is the alternate antenna, and

using transmission and reception results from only one antenna of the two antennas to determine whether to reverse which of the two antennas is the default antenna (col 4 line 33-col 6 line 2). **Claims 2 and 3:** Bartz discloses switching the antennas based on the results from the preferred antenna.

**Claims 4, 10:** Bartz discloses a method of providing antenna diversity in a communications system that contains a transmission device that sends and receives a plurality of transmit and receive packets (reads unicast) at a single location, the transmission device including two antennas 1 and 2, the method comprising

designating one antenna of the two antennas as a default antenna and the other antenna of the two antennas as an alternate antenna,

redesignating the default antenna and the alternate antenna, by changing which antenna of the two antennas is designated as the default antenna and which antenna is designated as the alternate antenna (col 2 lines 26-58),

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sending each transmit packet that acknowledges a previously received receive unicast packet using whichever antenna was used to receive the previously received receive unicast packet,

sending all other transmit packets a first time using the default antenna; listening for each receive packet that acknowledges a previously sent transmit packet using whichever antenna was used to send the previously sent transmit packet,

listening for all other receive packets using the default antenna, and for any transmit unicast packet, using the alternate antenna to send the transmit unicast packet to a destination after a number of unsuccessful sends of the transmit unicast packet using the default antenna (col 4 line 33-col 6 line 2). **Claim 6:** Bartz discloses that an unsuccessful send is based on an ACK packet not being received. **Claim 7:** the switch 3 and controller 5 are read as a management interface. **Claim 8:** Bartz discloses that the selection is done after packet buffering (col 3 lines 40-52), in which case such would inherently use a packet buffer descriptor. **Claim 9:** Bartz discloses that the default antenna is the one which sent a most recent packet and received a packet acknowledgement.

**Claim 13:** Bartz discloses a method of providing antenna diversity in a communications system that contains a transmission device that sends and receives a plurality of transmit and receive packets (reads unicast) at a single location, the transmission device including at least two antennas 1 and 2, the method comprising:

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designating one antenna of the at least two antennas as a default antenna, wherein an antenna of the at least two antennas other than the antenna that is designated as the default antenna is an alternate antenna (col 2 lines 26-58),

sending each transmit packet a first time using the default antenna and listening for each receive packet that acknowledges a previously sent transmit packet using whichever antenna of the at least two antennas was used to send the previously sent transmit packet,

listening for all other receive packets using the default antenna, and resending any transmit packet that was not successfully transmitted using one of the default antenna and the alternate antenna, until any such transmit packet is successfully transmitted or until a predetermined number of resends is reached (col 4 line 33-col 5 line 24), and

changing the default antenna between the at least two antennas in response to predetermined criteria that take into account which antenna successfully transmitted any transmit packet during the step of resending such that once the default antenna is changed, both the sending and listening steps will send and receive, respectively, using the changed default antenna (col 5 line 25-col 6 line 2). **Claims 14, 17, 20:** Bartz discloses that such a method operates in a communication system Base Station access point with a plurality of mobile stations as taught in claim 14 (col 4 lines 33-41) or at the mobile stations as taught in claim 17 (col 5 lines 34-50).

**Claims 22, 56, 77, 106:** Bartz discloses a method of providing antenna diversity in a communications system that contains a transmission device that sends and

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receives a plurality of transmit and receive packets (reads unicast) at a single location, the transmission device including at least two antennas 1 and 2, the method comprising

designating one antenna of the at least two antennas as a default antenna, wherein an antenna of the at least two antennas other than the antenna that is designated as the default antenna is an alternate antenna,

sending each transmit packet a first time using the default antenna as a transmit antenna, wherein for any transmit packet, the transmit antenna is whichever antenna of the at least two antennas is used to send the transmit packet (col 2 line 26-col 3 line 11),

listening for each receive packet that acknowledges a previously sent transmit packet using as a receive antenna the transmit antenna that was used to send the previously sent transmit packet, wherein for any receive packet, the receive antenna is whichever antenna of the at least two antennas is used to listen for the receive packet,

listening for all other receive packets using the default antenna as the receive antenna, and for any transmit packet, sending the transmit packet on the alternate antenna if the transmit packet is not successfully transmitted by the default antenna after one or more attempts, and

changing which antenna of the at least two antennas is the default antenna in response to predetermined criteria that take into account the success of the transmit antenna in transmission of transmit packets and the success of the receive antenna in reception of receive packets (col 4 line 33-col 6 line 2). **Claims 23-25, 57-59, 78-80, 107-109:** Bartz discloses changing the transmit and receive antennas by switching.



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**Claims 26-29, 60-63, 81, 82, 110-113:** Bartz discloses examining the success of a single antenna to determine switching. **Claims 32-38, 64, 83, 84, 94, 117-119, 122-124, 133:** Bartz discloses changing the antennas with a controller (reads software process) and a switch (reads hardware process) wherein the controller may learn in the long term which antenna is best based on present success (reads short-term, col 10 line 57-col 11 line 15). **Claims 39, 41, 42, 45, 46, 65, 66, 68, 86-88, 92, 121, 127, 128, 130, 131:** Bartz discloses switching antennas after a number of unsuccessful tries, which would inherently occur over a given time period. **Claims 47, 48, 67, 70, 93, 95, 129, 134:** Bartz discloses sending an acknowledge packet using the receive antenna as a transmit antenna, and changing the transmit antenna if no receive ACK packets are received. **Claims 89, 125:** an unsuccessfully received packet would inherently include those with errors. **Claims 102-105, 140-143:** Bartz discloses switching to the antenna which is most recently successful, which is the one which most recently received an ACK packet. **Claim 114:** Bartz discloses a mobile station. **Claims 148, 149:** Bartz discloses creating a table in the controller (reads software, col 11 lines 16-37).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 5, 11, 12, 49, 71, 90, 96, 126 and 135 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz.

**Claim 5:** while disclosing applicant's invention of claim 4 above, Bartz states that the number of unsuccessful tries is one. However, the choice of the number of tries would have been a routine engineering decision based on the sensitivity of the system, and as such one of ordinary skill in the art at the time of the invention would have found such a modification obvious.

**Claims 11 and 12:** given that CTS and RTS packets were notoriously well-known in the art of packet-switched communications at the time of the invention, the examiner takes Official Notice of such a feature and asserts that it would have been obvious to one of ordinary skill in the art at the time to use such packets as the packets taught by Bartz so as to operate in standard packet communications systems.

**Claim 49:** while disclosing applicant's invention of claim 22 and 23 above, Bartz fails to disclose that the retry count is two, however, such would have been a routine decision based on system resources.

**Claim 71:** please see the rejection of claim 49 above.

**Claim 96:** please see the rejection of claim 49 above.

**Claim 135:** please see the rejection of claim 49 above.

**Claim 90:** while not disclosing beacon packets, such were common in packet wireless networks, and as such the examiner takes Official Notice of such a feature, asserting that one of ordinary skill in the art would have thought the use of such packets

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obvious given that packet communication networks used beacon packet signals at the time.

**Claim 126:** please see the rejection of claim 90 above.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz as applied to claim 14 above, and further in view of Kandala, US Pat 6,505,037.

While disclosing applicant's invention of claim 14, Bartz fails to disclose that the Base Station and Mobile Stations are ad-hoc or 802.11(a) compliant devices. Kandala discloses the utility of using a multi-antenna diversity system such as that taught by Bartz to an 802.11(a) compliant system (col 2 line 44-col 3 line 5, abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Bartz in an 802.11(a) system so as to reduce power in such a system (col 2 lines 23-41).

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz as applied to claim 17 above, and further in view of Kandala.

Please see the rejection of claims 15 and 16 above.

Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz as applied to claim 22 above, and further in view of Kandala.

Please see the rejection of claims 15 and 16 above. Note that 802.11(a) uses OFDM.

Claims 115 and 116 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz as applied to claim 114 above, and further in view of Kandala.

Please see the rejection of claims 15 and 16 above.

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz in view of Kandala.

Bartz discloses a system for providing antenna diversity in a communications system that contains a transmission device that sends and receives a plurality of transmit and receive packets (reads unicast) at a single location, the transmission device including at least two antennas 1 and 2, the method comprising:

Means for designating one antenna of the at least two antennas as a default antenna, wherein an antenna of the at least two antennas other than the antenna that is designated as the default antenna is an alternate antenna (col 2 lines 26-58),

Means for sending each transmit packet a first time using the default antenna and listening for each receive packet that acknowledges a previously sent transmit packet using whichever antenna of the at least two antennas was used to send the previously sent transmit packet,

Means for listening for all other receive packets using the default antenna, and resending any transmit packet that was not successfully transmitted using one of the default antenna and the alternate antenna, until any such transmit packet is successfully transmitted or until a predetermined number of resends is reached (col 4 line 33-col 5 line 24), and

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Means (reads management interface) for changing the default antenna between the at least two antennas in response to predetermined criteria that take into account which antenna successfully transmitted any transmit packet during the step of resending such that once the default antenna is changed, both the sending and listening steps will send and receive, respectively, using the changed default antenna (col 5 line 25-col 6 line 2). Bartz discloses that such a system may comprise a plurality of mobile stations (col 5 lines 34-50).

Bartz fails to disclose that the Mobile Stations are ad-hoc or 802.11(a) compliant devices. Kandala discloses the utility of using a multi-antenna diversity system such as that taught by Bartz to an 802.11(a) compliant system (col 2 line 44-col 3 line 5, abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Bartz in an 802.11(a) system so as to reduce power in such a system (col 2 lines 23-41).

### ***Allowable Subject Matter***

Claims 40, 43, 44, 50-55, 69, 72-76, 85, 91, 97-101, 120, 127, 132, 136-139 and 144-147 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 40, 50, 72, 85, 97, 120 and 136 teach towards a system and method for

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providing antenna diversity with at least two antennas wherein a packet and acknowledgement received by an optimum antenna will cause the antenna to stay active or switch to an alternate antenna further including for any transmit unicast packet, changing the transmit antenna after every other unsuccessful resend of the transmit unicast packet.

Claim 43 teaches towards a system and method for providing antenna diversity with at least two antennas wherein a packet and acknowledgement received by an optimum antenna will cause the antenna to stay active or switch to an alternate antenna further wherein the number is adjusted prior to sending the transmit unicast packet a first time based on an expected collision rate in the communications system.

Claim 44 teaches towards a system and method for providing antenna diversity with at least two antennas wherein a packet and acknowledgement received by an optimum antenna will cause the antenna to stay active or switch to an alternate antenna further wherein the number is adjusted prior to sending the transmit unicast packet a first time based on an expected overall load rate of the communications system.

Claims 51, 73, 98 and 137 teach towards a system and method for providing antenna diversity with at least two antennas wherein a packet and acknowledgement received by an optimum antenna will cause the antenna to stay active or switch to an alternate antenna further wherein for any transmit unicast packet, attempting to send the transmit unicast packet twice on each antenna of the at least two antennas, beginning with the default antenna, until an overall number of sends of the transmit

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unicast packet is reached or until a receive packet that acknowledges the transmit unicast packet is received.

Claims 69 and 132 teach towards a system and method for providing antenna diversity with at least two antennas wherein a packet and acknowledgement received by an optimum antenna will cause the antenna to stay active or switch to an alternate antenna further wherein sending each transmit broadcast packet using the default antenna as the transmit antenna allows a first mobile station at another location, the first mobile station having at least two mobile station antennas, to learn which mobile station antenna of the at least two mobile station antennas receives transmit broadcast packets effectively from the access point.

Claims 91 and 127 teach towards a system and method for providing antenna diversity with at least two antennas wherein a packet and acknowledgement received by an optimum antenna will cause the antenna to stay active or switch to an alternate antenna further including changing which of the at least two antennas is designated as the default antenna if two consecutive receive beacon packets have been missed based on the expected time of arrival of the receive beacon packets from the access point.

Claim 144 teaches towards a system and method for providing antenna diversity with at least two antennas wherein a packet and acknowledgement received by an optimum antenna will cause the antenna to stay active or switch to an alternate antenna wherein for any destination transmission device of the destination transmission devices, identifying a corresponding individual antenna of the at least two antennas that is

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empirically known to communicate successfully with the destination transmission device.

**Conclusion**

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Hand delivered responses should be brought to Crystal Park II, 2121

Crystal Drive, Arlington VA, sixth floor (receptionist).

Any inquiry concerning this or earlier communications from the examiner should be directed to examiner Charles Craver at (703) 305-3965.

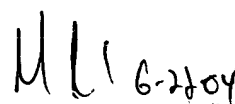
If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Vivian Chin, can be reached at (703) 308-6739.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at (703) 305-4700.

CC

C.Craver

June 22, 2004

  
CHARLES CRAVER  
PATENT EXAMINER